

CLAIMS

1. An optical communication apparatus in which light for transmission and light for receipt are propagated simultaneously over a sole cable to effect bidirectional communication, comprising:

light emitting means for emitting said light for transmission;

light receipt means for receiving said light for receipt; and

light guide means for guiding said light for transmission over said cable and for guiding said light for receipt to said light receipt means, wherein

a value of a light volume M of stray light generated with respect to said light

receipt means satisfies the following relationship:

$$S - 2QN \geq M > S/2Q - N$$

where Q is the value of a Q-value representing communication quality as required, S is light volume of a received signal from a communication partner and N is a sum total of a Gaussian noise.

2. The optical communication apparatus according to claim 1 wherein a ratio S/M, where S is the light volume of the received signal and M is the light volume of the stray light is 7% to 30%.

3. The optical communication apparatus according to claim 1 wherein a transmission speed in said optical communication is not lower than 100 Mbps.

4. The optical communication apparatus according to claim 1 wherein said cable is a plastic optical fiber.

5. The optical communication apparatus according to claim 1 wherein the sum of light volumes of the reflected light from the communication partner is 0.7% to 3.0% of the volume of the received light in said communication partner.

6. An optical communication method by an optical communication apparatus comprising light emitting means for emitting light for transmission, light receipt means for receiving light for receipt and light guide means for guiding light for transmission over said cable and for guiding said light for receipt to said light receipt means, said light for transmission and said light for receipt of substantially the same wavelength being propagated substantially simultaneously by a sole cable to effect bidirectional communication; wherein

value of a light volume M of stray light generated with respect to said light receipt means satisfies the following relationship:

$$S - 2QN \geq M > S/2Q - N$$

where Q is the value of a Q-value representing communication quality as required, S is the light volume of a received signal from a communication partner and N is a sum total of a Gaussian noise.

7. An optical communication apparatus in which light for transmission and light for receipt of substantially a same wavelength are propagated simultaneously over a sole cable to effect bidirectional communication, comprising:

light emitting means for emitting said light for transmission;

light receipt means for receiving said light for receipt;

light guide means for guiding said light for transmission over said cable and for guiding said light for receipt to said light receipt means, and

controlling means for controlling said light emitting means and the light receipt means, said controlling means allowing for processing of a signal corresponding to said light for receipt received by said light receipt means in a state in which said light for transmission is emitted by said light emitting means and propagated over said cable, said controlling means allowing for processing for transmission of a signal by said light for transmission emitted by said light emitting means in a state in which the light for receipt propagated over said cable is being received by said light receipt means.

8. An optical communication method for an optical communication apparatus comprising light emitting means for emitting light for transmission, light receipt means for receiving light for receipt and light guide means for guiding light for transmission to said cable and for guiding said light for receipt to said light receipt means, in which said light for transmission and said light for receipt of substantially a same wavelength are propagated simultaneously over a sole cable to effect bidirectional communication; said optical communication method comprising the steps of:

allowing for processing of a signal corresponding to said light for receipt received by said light receipt means in a state in which said light for transmission is emitted by said light emitting means and propagated over said cable; and

allowing for processing for transmission of a signal by said light for

transmission emitted by said light emitting means in a state in which the light for receipt propagated over said cable is being received by said light receipt means.